



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105**

Aug 11, 2005

In Reply Refer To: WTR-7

Tony Charles, Plant Manager
Oakley, Inc.
95 Lakes Blvd
Dayton, Nevada 89403

Re: June 28, 2005 Wastewater Inspection

Dear Mr. Charles:

Enclosed is the August 11, 2005 report for our June 28, 2005 inspections of the Oakley, Inc. facility and Lyon County's South Dayton Valley wastewater treatment plant. The primary overall finding is that the industrial users in the Lyon County service area discharge non-domestic wastewaters to the sewers without valid permits. The main finding regarding Oakley is that Oakley discharges numerous untreated wastewaters of unknown strength and quality including some that could pose risks of flammability, obstruction, and toxic fumes. In particular, Oakley was the likely source of numerous releases of solvent odors from the Lyon County sewers. These sewer conditions are specifically prohibited by the Federal pretreatment regulations for publicly-owned treatment works under the Clean Water Act.

Lyon County is in the process of developing a pretreatment program to regulate the non-domestic discharges into its treatment works. Upon obtaining approval, Lyon County would issue permits to Oakley and to the other industrial users. This process could take a year or more. In the mean time, in lieu of County permits, EPA proposes to inspect each of the industrial users subject to Federal regulation and perhaps issue Administrative Orders that establish the applicable sewer discharge limits and set self-monitoring requirements. Alternately, the Nevada Division of Environmental Protection ("NDEP") could use the EPA inspections to issue its own interim permits on a case-by-case basis although the overall authority for pretreatment has not been delegated to Nevada as of yet. These inspections will point up the eventual need for State authority to extend the pretreatment regulations in their entirety to the publicly-owned treatment works, such as Lyon County, that do not discharge to surface waters under an NPDES permit.

The inspection report provides an initial determination of the technical restrictions upon the various discharges, as well as specific requirements for self-monitoring. From these, and with your input through the permit application process, Lyon County should be able to draft a valid permit. Please submit a short response to the findings in Sections 2 through 5 of this report, to both EPA, the NDEP, and Lyon County, by **September 30, 2005**.

I appreciate the helpfulness of you and your staff extended to me during this inspection and your willingness to allow us to provide direction to Lyon County as they establish their sewer service requirements. Our interest here is in the regulatory control of industrial wastewater dischargers in the small sewer districts like Lyon County that are not required to operate approved pretreatment programs. I remain available to Lyon County and to you to assist

in any way I can. Once again, thank you for your cooperation during this inspection. Please do not hesitate to call (415) 972-3504 or e-mail at arthur.greg@epa.gov.

Sincerely,

*Original signed by:
Greg V. Arthur*

Greg V. Arthur
Clean Water Act Compliance Office

cc: Skeet Sellers, Lyon County Utilities Department
Joe Maez, State of Nevada, Division of Environmental Protection
Scott Albin, Oakley



U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION 9

CLEAN WATER ACT COMPLIANCE OFFICE

NPDES COMPLIANCE EVALUATION INSPECTION REPORT

Industrial User: Oakley, Inc.
95 Lakes Blvd, Dayton, Nevada 89403
Non-categorical Significant Industrial User

Treatment Works: Lyon County Utilities Department
South Dayton Valley Wastewater Treatment Plant
(No NPDES Permit - Nevada Permit NEV10017)

Date of Inspection: June 28, 2005

Inspection Participants:

US EPA: Greg V. Arthur, Region 9, CWA Compliance Office, (415) 972-3504

State of Nevada: Joe Maez, NDEP, Bureau of Water Pollution Control, (775) 687-9431
Matt McAuliffe, NDEP, Bureau of Waste Mgmt, (775) 687-6396
Martin Azevedo, NDPS, State Fire Marshal Division, (775) 848-1612

Lyon County: Skeet Sellers, Utilities, Wastewater Supervisor, (775) 246-6220
Chuck Ritter, Central Lyon County Fire District, (775) 246-6209
Mike Workman, Utilities Director, (775) 246-6220

Oakley, Inc: Tony Charles, Plant Manager, (775) 246-9123
Scott Albin, Process Technician, (775) 246-9123
Mike Hutchinson, Supervisor, First and Second Shift, (775) 246-9123

Report Prepared By: Greg V. Arthur, Environmental Engineer
August 11, 2005

Section 1

Introduction and Background

1.0 Scope and Purpose

On June 28, 2005 EPA, the State of Nevada Department of Environmental Protection (“NDEP”), the State of Nevada Department of Public Safety, and Lyon County conducted a multi-media compliance evaluation inspection of Oakley, Inc. in Dayton, Nevada. One of the purposes was to ensure compliance with the Federal, State and local regulations covering the discharge of non-domestic wastewaters into the sewers under the Clean Water Act and the Nevada Revised Statutes. In particular, it was to ensure:

- Classification in the proper Federal categories;
- Application of the correct Federal, State and local standards at correct sampling points;
- Consistent compliance with the standards; and
- Fulfillment of Federal self-monitoring requirements.

Oakley qualifies under the Clean Water Act as a significant industrial user (“SIU”) within the Lyon County Utilities sewer service area. Lyon County operates the South Dayton Valley wastewater treatment plant under a State of Nevada ground water permit. It does not operate under an NPDES permit because the wastewater treatment plant discharges to ground waters and to a golf course for reclaim. Lyon County Utilities does qualify under the Clean Water Act as a publicly-owned treatment works (“POTW”) subject to the Federal regulations for pretreatment and sludge in 40 CFR 403 and 503. Oakley will receive separate reports from the participating agencies. The inspection participants are listed on the title page. Arthur jointly conducted the inspection of Oakley and of the South Dayton Valley wastewater treatment plant on June 28.

1.1 Process Description

Oakley manufactures and assembles titanium eyeglass frames at 95 Lakes Blvd in Dayton, Nevada. Oakley operates three shifts per day. Manufacturing began in 1997 although the building previously housed a stainless steel golf club foundry from 1992 through 1997. Oakley is one of a number of commercial and industrial tenants of the Dayton Valley Business Park.

The on-site operations involve titanium alloy investment casting, parts assembly, and packaging, as well as the support operations such as facilities maintenance, waste materials handling, water supply preconditioning, fume scrubbing, and cooling. The titanium alloys primarily are vanadium and aluminum. The titanium investment casting process, also known as the lost wax process, consists of wax melting, wax pattern injection molding, wax pattern

etching, ceramic shell coating of the wax patterns, ceramic mold curing, wax removal, titanium billet pre-heating, titanium electric-arc furnace melting and casting, and titanium cast cooling. The titanium casts are then finished through hand hammering to remove the ceramic shell, sawing to remove risers, preliminary sand blasting, hand grinding, CNC tapping, vibratory deburring, and alumina and ceramic bead finish blasting. Oakley sends some parts off-site for vapor deposition. Stainless steel dies used for wax pattern injection molding are sent off-site for regrinding. Oakley perform no surface finishing steps such as electroplating, electroless plating, conversion coating, chemical etching, or anodizing. Lens and screws are purchased from outside suppliers.

1.2 SIC Codes

Oakley is assigned the SIC codes for non-ferrous non-aluminum die casting and for the manufacturing of ophthalmic frames, (SIC 3364 and 3851).

1.3 Wastewater Sources

Oakley discharges most of its process wastewaters to the Lyon County domestic sewer system through one combined domestic sewer connection. The process wastewaters are collected into in-plant sewers at numerous locations. The overall compliance sampling point is designated as IWD-OK1 for the purposes of this inspection report. Storm water run-off and some non-domestic wastewaters discharge to the concrete paving and drainages channels outside to the west behind the building. There was one unidentifiable sewer clean-out outside on the south side of the building. See Appendix 1.

- Floor Cleaning – Most of the facility does not have floor drains. The floors are swept and periodically wet cleaned using a zamboni with the resulting mop waters drained to the sewers through the transfer room floor sink. See Photo 1 below.



This shows the transfer room floor sink and barrels of ceramic shell kettle wash-down, awaiting disposal into the floor sink.

Photo No.1

Taken by: Greg V. Arthur

Date: June 28, 2005

- Wax Pattern Etching – Five 50+ gallon tanks in the wax injection room are used to clean and etch the wax patterns prior to ceramic coating. The process involves Remet Pattern Wash, a solvent mold release cleaner, in Tank 1 followed by a static rinse in Tank 2, dilute alkaline degrease rinsing in Tank 3 followed by a static rinse in Tank 4, and a final alkaline surfactant coating in Tank 5. See Photo 2 below. All spent solutions are discharged to the sewers untreated. Tank 1 spents are discharged once per quarter to a floor drain in the CNC room. See Photo 3 below. Tanks 2, 3 and 4 spents are discharged once per day to the transfer room floor sink. Tank 5 spents are discharged once per week to the transfer room floor sink. See Photo 1 above.



This illustrates the five tanks used for wax mold etching:
Tank 1 – solvent
Tank 2 – rinse
Tank 3 – degrease
Tank 4 – rinse
Tank 5 – coating

Photo No.2
Taken by: Greg V. Arthur
Date: June28, 2005



This illustrates the floor drain in the CNC room. A water sprayer in the work sink over the floor drain is left on when the contents of Tank 1 drain for 2-hrs through a metered spigot.

Photo No.3
Taken by: Greg V. Arthur
Date: June28, 2005

- Ceramic Shell Coating – The wax patterns are dipped in ceramic slurry and open-air cured in order to form a hard shell coating, into which the titanium is cast. The first coating involves an ammonia-based ceramic slurry. The next three coatings involve water-based slurries. The final coating is with a water-based sanded slurry. Spent slurries are barreled for in-barrel open-air evaporation outside to the west of the building. Some slurry kettles are cleaned by chipping out the remaining slurry hardened on the walls. Other slurry kettles are washed out with the kettle washdown barreled for discharge to the sewers through the transfer room floor sink. See Photo 1 on page 3. Spent ion exchange columns used in DI-water make-up are off-hauled.
- Wax Removal – The hardened ceramic shell molds are heated and steam-jet cleaned inside boiler-heated vessels in order to drain out and remove the wax. The steam jet washdown and boiler blowdown discharge intermittently through out the day to the sewers through a floor drain located between the two boiler-heated autoclaves. The steam jet washdown would be expected to entrain wax and suspended solids. The boiler blowdown would be expected to contain a corrosion inhibitor. See Photo 4 below.



This illustrates the floor drain into which discharge the steam jet washdown and boiler blowdown from the wax removal

Photo No.4
Taken by: Greg V. Arthur
Date: June28, 2005

- Titanium Casting – Titanium is melted into the ceramic shells in electric-arc furnaces. Copper electrode pots in the furnaces are water-jacket cooled by circulating chillers which drain their blowdown to the concrete floor in the utility room. From there, the chiller blowdown drains out onto the pavement outside on the west side of the building.
- Wet-Scrubber – The furnace exhaust vents through a wet-scrubber located outside of the building. The fume scrubber blowdown drains into the sewers through a floor drain located near the eyewash station in the corner of the casting room. The circulating fume scrubber water is also changed-out periodically with the spents hauled to the transfer room floor sink for discharge to the sewers. See Photo 5 below on the next page. See Photo 1 on page 3. Some overspray or fume scrubber overflow stained the pavement outside on the west of the building.



This illustrates the floor drain into which the wet-fume scrubber blowdown discharges to the sewer.

Photo No.5
Taken by: Greg V. Arthur
Date: June28, 2005

- Cast Finishing – Riser cut-off, sand blast cleaning, hand grinding, ceramic bead blasting, and aluminum sand blasting of the titanium casts generate no wastewaters. Titanium anode cutting produces a spent water-based coolant. Thread tapping produces spent oil-based coolants. All coolants are off-hauled for reclaim and disposal by Safety Clean. Vibratory deburring produces a soapy washdown which is paper filtered into barrels for discharge to the sewers through the CNC room floor drain. See Photo 3 on page 4 and Photo 6 below.



This illustrates one vibratory deburring machine and transfer barrels filling with washdown for discharge to the sewers.

Photo No.6
Taken by: Greg V. Arthur
Date: June28, 2005

1.4 Process Wastewater Composition

The following determinations of the composition and destination of the wastewaters listed above in section 1.3 were determined strictly by interview, observation, and literature search. There were no sample results specific to these wastewaters in the sample record for Oakley.

• sewer	zamboni mop waters	hydrocarbons, solids, surfactants
• sewer	spent wax pattern etchant	aromatic hydrocarbons, wax
• sewer	spent wax etch rinses	aromatic hydrocarbons, wax
• sewer	spent wax surfactant coat	surfactant
• sewer	slurry kettle washdown	ceramic slurry, solids, ammonia
• sewer	steam jet washdown	wax, solids
• sewer	autoclave boiler blowdown	corrosion inhibitor, dissolved solids
• pavement	casting chiller blowdown	descalant, titanium sludge
• sewer	fume scrubber blowdown	dissolved solids, titanium sludge
• pavement	fume scrubber overspray	dissolved solids, titanium sludge
• sewer	vibratory debur washdown	surfactant, solids, titanium sludge
• off-haul	spent machine shop coolants	synthetics, hydrocarbons, solids

The spent wax pattern etchant consists of aromatic hydrocarbons, ethyl glycol monobutylether (2-butoxyethanol), emulsifiers and dispersants. The spent wax surfactant coating consists of ethanol and sodium sulfosuccinate. The chiller descalant is a proprietary admixture of phosphoric acid. The ceramic slurries consist of zircon silicate, a number of binders (possibly such as ethyl silicate, sodium silicate, non-polyvinyl chloride latex), and surfactants. EPA did not determine the chemical nature of the corrosion inhibitor.

1.5 On-Site Process Wastewater Treatment

Oakley provides no treatment beyond the paper filtering of vibratory deburring washdown. All other non-domestic wastewaters discharge without treatment to the sewers or to the pavement outside of the building. See Appendix 1.

- Residuals Handling – Titanium scrap is re-melted a number of times until the alloy is no longer usable at Oakley. Unusable scrap titanium and wax scrap is collected for off-site reclaim. Unusable ceramic slurry is hardened on-site for off-site disposal as non-hazardous. Spent water- and oil-based machining coolants are off-hauled for reclaim or disposal by Safety Kleen. Titanium sludges, spent filter paper, fume scrubber sludges, and dry sweepings are off-hauled for disposal as non-hazardous. Spent ion exchange canisters are changed-out and regenerated off-site by Culligan.
- Sewer Discharge and Compliance Sampling – According to Lyon County, all in-plant sewers for both process wastewaters and building domestic sewage converge just outside of the building entrance for discharge through one sewer connection to the Lyon County sewers. There is no sample box designated for compliance self-monitoring, although a clean-out exists at the point where the plant sewers converge. This sewer clean-out is designated as the compliance sampling point IWD-OK1 for the purposes of this

inspection report. An additional sewer clean-out of unidentified use is located outside on the south side of the building.

1.6 POTW Wastewater Treatment

State and Federal Legal Authorities – Lyon County operates the South Dayton Valley wastewater treatment plant under the authority of State permit NEV10017 issued by NDEP for the discharge of treated wastewater for reclaim and to the ground water. Lyon County does not possess a Federal NPDES permit issued under the Clean Water Act because the treated wastewaters do not discharge to surface waters. Nevertheless, Lyon County does qualify as a publicly-owned treatment works (“POTW”) under the Federal definition in 40 CFR 403.3(o) because the wastewater treatment plant treats mixed domestic and non-domestic wastewaters and its sludges are regulated under the Clean Water Act by the Federal regulations in 40 CFR 503.

POTW Configuration – The South Dayton Valley wastewater treatment plant consists of two treatment trains: a sequencing batch reactor (“SBR”) for a portion of the domestic sewage from the City of Dayton, and extended aeration lagoons for the remaining domestic sewage from the City as well as the domestic and non-domestic flows from the Dayton Valley business park. Treated wastewaters are discharged to a golf course for reclaim and through rapid infiltration basins to the ground water.

- Sequencing Batch Reactor – The City of Dayton generates an average of 220,000 gpd of domestic sewage. The domestic sewage from the City through lift station #2 undergoes auger comminution before feeding at a constant 140,000 gpd rate into the SBR. The remaining domestic flows are diverted through a splitter to the extended aeration lagoons. The SBR contents are aerated for 24 minutes, allowed to become anoxic for 24 minutes, allowed to settle for 60 minutes and decanted for 60 minutes. Waste activated sludge is drawn from the SBR and aerobically digested for around 3 days. Since the majority of the produced activated sludge remains in the reactor, the mean cell residence time is long enough to provide both aerobic degradation and nitrification of ammonia to nitrates. The anoxic sequence also provides denitrification of nitrates to nitrogen gas. The SBR discharges without chlorination to a golf course for reclaim. The aerobic digester sludges are transferred to the extended aeration lagoons. The influent and effluent compliance sampling points are designated as IWD-SD01 and IWD-SD02 for the purposes of this report. The influent contribution sample point from the city at lift station #2 is designated as IWD-LS2.
- Extended Aeration Lagoons – The Dayton Valley business park generates an average of 60,000 gpd of process-related wastewaters and domestic sewage. Business park wastewaters through lift station #3, excess domestic sewage from city averaging 80,000 gpd, and the aerobic digester sludge from the SBR feed into the first of four lagoons. Primary Ponds #1 and #2 are aerated lagoons in series, each providing ~50 days of treatment capacity. Secondary Ponds #A and #B are facultative lagoons operated one at a time to provide an average of ~50 days of additional treatment capacity. The facultative lagoons discharge without chlorination to a rapid infiltration basin. The influent and

effluent compliance sampling points are designated as IWD-SD3 and IWD-SD4 for the purposes of this report. The influent contribution sample point from the business park at lift station #3 is designated as IWD-LS3.

- Sludge – For the first time this summer, Lyon County plans to dredge out the accumulated sludge from Primary Pond #1 for disposal. Lyon County has not yet in 18 years disposed of the sludge. The sludge sampling point is designated as IWD-SD05 for the purposes of this report.

WWTP Performance – The permit limits that apply to the South Dayton Valley wastewater treatment plant and the Federal sludge limits that apply to the disposal of the treatment plant sludge are listed in Appendix 4. The permit limits for the SBR effluent through IWD-SD02 cover conventional pollutants, pH, and nutrients. They do not cover the discharge of toxic metals, toxic organics, pesticides, or any toxic pollutants including any measures for toxics such as whole effluent toxicity. The permit limits for the pond effluent through IWD-SD04 cover conventional pollutants, pH, as well toxic metals, but not toxic organics, pesticides, any other toxic pollutants, nor whole effluent toxicity. The permit limits for the pond effluent through IWD-SD04 also do not cover nutrients but do assign nitrate limits to the receiving ground waters as sampled in the surrounding monitoring wells. See Appendices 5 and 6 for water quality data for the South Dayton Valley wastewater treatment plant at IWD-SD02 and IWD-SD04.

- SBR Effluent @ IWD-SD02 – According to Lyon County, there are no industrial wastewater contributions from any industrial user, including Oakley or any other Dayton Valley business park tenant, treated through the SBR for reuse on the golf course.
- Pond Effluent @ IWD-SD04 – There are numerous industrial users of the sewers leading to the extended aeration ponds at the South Dayton Valley wastewater treatment plant. It cannot be determined at this time whether the pond effluent violations are from industrial sources or the result of the treatment plant design and operation. In particular, the pond effluent did not consistently comply with the permit limits for total suspended solids, BOD, antimony, selenium, and maximum pH. The pH limit violation is likely unrelated to incoming water quality but rather the result of algal growth in the summer months. However, the average and calculated 99th% peaks of 27 and 43 mg/l BOD and 67 and 109 mg/l TSS are indications of incomplete or compromised treatment.
- Sludge Quality @ IWD-SD05 – The pond sludge has not yet been dredged for disposal. The Federal sludge limits in 40 CFR 503.10 are set in mg-pollutant/kg-sludge by dry-weight, and would apply upon disposal of the sludge.
- WWTP Interference from the Collection System – There have been a number of reported instances of WWTP interference, all attributable to Oakley. All of them involve the release of objectionable odors from the collection system. The petroleum distillate fumes were most strongly detected at lift station No.3 but also found in the sewers leading from Oakley. Lyon County obtained samples of the sewers indicating the presence of methylbenzene, a petroleum distillate not found in domestic sewage the fumes of which could cause worker health and safety risks. See Appendix 2 and Item 4.2 of this report.

1.7 POTW Legal Authorities

The NDEP permit does not require Lyon County to obtain an approved pretreatment program. This is in keeping with the Federal pretreatment regulations in 40 CFR 403.8(a) that allow for, but do not mandate, States or EPA to require small POTWs with design capacities under 5.0 mgd to obtain approved pretreatment programs. Furthermore, the NDEP permit also does not impose any pretreatment provisions. The State of Nevada has the authority to assume some or all of the functions of the pretreatment program under 40 CFR 403.10(e,f). However, NDEP has recommended that Lyon County obtain an approved pretreatment program. Lyon County has drafted a sewer use ordinance, currently undergoing review by EPA. The proposed local limits will have to be re-determined since they are not technically-based on the performance of the Lyon County wastewater treatment plants.

The requirements of an approved pretreatment program would include the following:

- The implementation of the general and specific national prohibitions in 40 CFR 403.5 for industrial users against the introduction of incompatible wastewaters;
- The requirement in 40 CFR 403.5 to develop locally-determined limits necessary to protect the treatment works from potential adverse impacts, such as operational interference, worker health and safety risks, the pass-through of pollutants to the receiving waters, and sludge contamination;
- The performance of the program functions set forth in 40 CFR 403.8, such as identifying industrial users, issuing permits, inspecting and sampling industrial users, providing adequate funding, and enforcing against violators;
- The implementation of an industrial users self-monitoring program under 40 CFR 403.12;
- The implementation of the provisions against bypassing under 40 CFR 403.17;
- The implementation of Federal categorical standards under 40 CFR 403.6; and
- The enacting of the local legal authorities necessary to operate an approved pretreatment program under 40 CFR 403.8.

Section 2

Sewer Discharge Standards and Limits

Federal categorical pretreatment standards (where they exist), national prohibitions, and the local limits (where they exist) must be applied to the sewer discharges from industrial users into POTWs. 40 CFR 403.5 and 403.6.

2.0 Summary

Oakley does not operate under the authority of an enforceable sewer discharge permit for its discharges to the Lyon County sewers. Oakley is subject to the self-implementing authority of the national prohibitions in 40 CFR 403.5(a)(b). Once Lyon County obtains pretreatment program approval, the local limits would be technically-based on State ground water and reuse limits and Federal sludge standards that now apply to the South Dayton Valley wastewater treatment plant. See Appendix 2 for the sewer discharge limits that apply to Oakley.

Requirements

- An industrial user permit for Oakley must be issued either by Lyon County or NDEP.
- Any permit for Oakley must apply technically-based local limits derived from the regulatory requirements that now apply to the South Dayton Valley wastewater treatment plant.
- Oakley must ensure that no non-domestic wastewaters including cooling tower blow-down and fume scrubber overspray can discharge to the pavement outside of the building.

Recommendations

- Any permit for Oakley should require periodic self-monitoring of the discharge to the sewers for flow rate and for:
 - Pollutants that are regulated either under the national prohibitions (*pH, closed-cup flashpoint, EPA-method 624 volatile and 625 semi-volatile organics, oil & grease*).
 - Pollutants that would likely be of concern as a risk of pass-through (*oil & grease, chlorides, nitrates, total suspended solids, specific conductivity*).
 - Pollutants that would likely be of concern as a risk of treatment works interference (*total suspended solids, ammonia, oil & grease, sulfides, pH*).Priority pollutant scans would be required to identify changes in discharge quality (*toxic metals, BOD, barium*).
- Oakley should install a sewer sampling station outside of the building and certify that all non-domestic wastewaters discharge to the sewers through the installed sample point.

2.1 Classification by Federal Point Source Category

Oakley does not qualify for regulation under any of the Federal categorical standards in 40 CFR 407-471. In particular, Oakley does not qualify for regulation under the Federal metals molding and casting standards because 40 CFR 464 applies to the casting of aluminum, copper, ferrous-alloys, and zinc. Oakley also does not qualify under the Federal titanium forming standards because 40 CFR 471 Subpart F applies to titanium casting related to a forming process such as extrusion, drawing, forging, swaging, cladding, or tube reducing. Oakley also does not qualify under the Federal primary and secondary titanium standards because 40 CFR 421 Subpart AB applies to titanium casting related to the refining of titanium ore into metal or the rerefining of titanium scrap.

2.2 Local Limits and National Prohibitions

Local limits and the national prohibitions are meant to express the limitations on non-domestic discharges necessary to protect the sewers, treatment plants, treatment plant sludges, and their receiving waters from adverse impacts. Generally, numerical local limits that are technically-based supplant the narrative national prohibitions.

National Prohibitions – For POTWs to surface waters, the national prohibitions in 40 CFR 403.5 prohibit discharges that can cause the pass-through of pollutants into the receiving waters, the operational interference of the treatment works, the contamination of the sewage sludge, sewer worker health and safety risks, fire or explosive risks, and corrosive damage to the sewers. However, pass-through and interference as defined in the Federal pretreatment regulations can only occur when NPDES permit limits are violated. So in this case, without an NPDES permit for the South Dayton Valley wastewater treatment plant, the national prohibitions cannot prohibit discharges that result in violations of the NDEP ground water permit either through the pass-through of pollutants or through an operational interference. They do however still prohibit discharges that cause an operational interference resulting in an unpermitted discharge or bypass into surface waters.

Local Limits – However, the local limits should protect the POTW from adverse impacts including violations of all Federal and State permits. In this case, technically-based local limits would be approved if they also can restrict discharges that can cause the pass-through of pollutants and operational interference resulting in violations of the NDEP ground water permit, including the narrative prohibition in the NDEP permit against the release of objectionable odors from the sewer collection system. As a result, the Lyon County local limits will have to be re-determined based on the performance of the wastewater treatment plants and the current regulatory requirements as expressed in the NDEP permit and the Federal sludge regulations. Once they have been approved and adopted they would apply to all non-domestic discharges in its service area. See Appendix 2 for the national prohibitions and local limits that apply will apply.

2.3 State Storm Water Requirements

Under the Nevada State general storm water permit, Oakley is prohibited from allowing process-related wastewaters to come in contact with storm water runoff. This specifically prohibits the drainage of cooling tower blowdown from the utility room to the pavement as well as the overflow and overspray of fume scrubber washwater onto the pavement.

2.4 Point(s) of Compliance

Local limits and the national prohibitions apply end-of-pipe to all non-domestic flows from Oakley. The sample point designated in this report as IWD-OK1 is a hypothetical end-of-pipe sample point representative of the day-to-day non-domestic wastewater discharges from the facility. The sewer clean-out on the building connection identified as extending from near the front door of the building to the street could serve as IWD-OK1 if all non-domestic wastewaters discharge through that connection past that clean-out. In any case, Oakley as well as the other industrial users of the Lyon County sewers, each should install a sampling station that accounts for all non-domestic discharges to the sewers and allows both composite sampling and flow rate monitoring.

2.5 Compliance Sampling

Local limits and the national prohibitions are instantaneous-maximums and are comparable to samples of any length including single grab samples.

2.6 Pollutants of Concern

The pollutants of concern for Oakley comprise those regulated by the national prohibitions, and certain site-specific pollutants for which there is a potential to cause the South Dayton Valley wastewater treatment plant to violate its NDEP permit or Federal sludge limits.

National Prohibitions – From this inspection, EPA determined that the pollutant measures regulated by the national prohibitions at Oakley include the following:

- pH for corrosivity, *40 CFR 403.5(b)(2)*,
- closed-cup flashpoint for explosivity, *40 CFR 403.5(b)(1)*,
- EPA-method 624 volatile and EPA-method 625 semi-volatile organics for worker health and safety from risks from the inhalation of toxic fumes, *40 CFR 403.5(b)(7)*, and
- oil & grease for sewer obstructions, *40 CFR 403.5(b)(3)*.

Local Limits – Site-specific pollutants can cause violations of the NDEP permit or Federal sludge limits in two ways. First, the pollutants could cause an operational interference of the treatment works which results in either (1) the unauthorized release of untreated or partially treated sewage or (2) the violation of permit limits for pollutants that measure performance such as BOD. Second, the pollutants could pass-through the treatment works into either the

WWTP sludge or the receiving waters at levels exceeding permit or regulatory limits. From this inspection, EPA determined that the pollutants of concern at Oakley likely include the following:

- pH, total suspended solids, sulfides, oil & grease including wax for sewer obstruction risks, and ammonia – *as a risk of adversely affecting the treatment works.*
- suspended solids, specific conductivity, oil & grease, chlorides, nitrates, and possibly certain toxic metals, and BOD – *as a risk of pass-through.*

A definitive determination of whether the site-specific pollutants pose a risk cannot be made without increased monitoring of the South Dayton Valley wastewater treatment plant and the subsequent development of technically-based local limits. See Appendices 2 and 3.

Section 3

Compliance with Federal Standards

Industrial users must comply with the Federal categorical pretreatment standards that apply to their process wastewater discharges. 40 CFR 403.6(b).

Categorical industrial users must comply with the prohibition against dilution of the Federally-regulated waste streams as a substitute for treatment. 40 CFR 403.6(d).

Industrial users must comply with the provision restricting the bypass of treatment necessary to comply with any pretreatment standard or requirement. 40 CFR 403.17(d).

3.0 Summary

No Federal categorical pretreatment standards apply to the discharges of non-domestic wastewater from Oakley.

Requirements

- None.

Recommendations

- None.

Section 4

Compliance with Local Limits and National Prohibitions

All non-domestic wastewater discharges to the sewers must comply with local limits and the national prohibitions. 40 CFR 403.5(a,b,d).

Industrial users must comply with the provision restricting the bypass of treatment necessary to comply with any pretreatment standard or requirement. 40 CFR 403.17(d).

4.0 Summary

All wastewater discharges to the sewers are untreated. As a result, the pollutants introduced to the sewers include aromatic hydrocarbons and organic solvents from wax pattern etching, suspended solids from ceramic slurry clean-up and vibratory deburring, and oil & grease from wax pattern etching, wax pattern removal, and machine shop clean-up. The pollutants introduced to the sewers may also include ammonia from ceramic slurry clean-up, and low pH from fume scrubber blowdown. The uncontrolled discharges from Oakley pose a risk to sewer worker health and safety from toxic fumes, of sewer flammability, and possibly of causing sewer obstruction. The Federal regulations in 40 CFR 403.5 specifically prohibit the discharge of pollutants that pose these defined risks to the POTW. In addition, the uncontrolled discharges could pose a risk of causing an operational interference of the wastewater treatment plant or the pass-through of suspended solids, toxics, salts, or nutrients to the receiving ground waters or to the sludge. However, no definitive conclusions regarding overall compliance can be made until both technically-based local limits are enacted in a permit to cover the pollutants of concern and comprehensive sampling begins.

Requirements

- Wastewaters containing aromatic hydrocarbons and volatile organic solvents cannot be discharged to the sewers.
- Self-monitoring must begin for total toxic organics, closed-cup flashpoint, total suspended solids, pH, oil & grease, nutrients, salts, toxic metals, toxic organics, and BOD.

Recommendations

- Any ammonia-based slurry washdown should not be discharged to the sewers.
- All process-related wastewaters should be separated from domestic flows and discharged through a final equalization tank that provides at least 24-hours of holding and mixing.
- Wax-bearing wastewaters should be screened or settled prior to discharging to the sewers.

4.1 National Objectives

The general pretreatment regulations were promulgated in order to fulfill the national objectives to prevent the introduction of pollutants that:

- (1) cause operational interference with sewage treatment or sludge disposal,
- (2) pass-through sewage treatment into the receiving waters or sludge,
- (3) are in any way incompatible with the sewerage works, or
- (4) do not improve the opportunities to recycle municipal wastewaters and sludge.

This evaluation includes an abbreviated evaluation of whether achievement of the national objectives in 40 CFR 403.2 have been demonstrated by consistent compliance with the sludge and discharge limits at the South Dayton wastewater treatment plant. See section 1.6 of this report.

4.2 The National Prohibition Against Toxic Fumes That Could Cause Acute Worker Health and Safety Problems

According to Lyon County, POTW personnel detected over the past five-years hydrocarbon fumes in the sewers, at lift station #3, and at the South Dayton wastewater treatment plant. As a result, Lyon County began sampling the Dayton Valley business park sewers in February 2005. The Lyon County sampling detected the presence of 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and isopropylbenzene, but not upstream of Oakley, indicating that these pollutants were introduced by Oakley. From this inspection, EPA determined that Oakley uses a wax pattern etchant identified as Remet Pattern Wash, listed in its MSDS sheet to primarily consist of aromatic hydrocarbons and the organic solvent, ethyl glycol monobutyl ether (also known as 2-butoxyethanol). EPA also determined that Oakley periodically discharges the spent wax pattern etchant approximately once per quarter and its spent rinses every working day. The NIOSH Guide to Chemical Hazards indicates that 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, isopropylbenzene, and 2-butoxyethanol all pose acute inhalation and contact risks to sewer workers.

Comprehensive risk information is available on the following web-pages:

<http://www.cdc.gov/niosh/ipcsneng/neng1433.html> - for 1,2,4-trimethylbenzene

<http://www.cdc.gov/niosh/ipcsneng/neng1155.html> - for 1,3,5-trimethylbenzene

<http://www.cdc.gov/niosh/ipcsneng/neng0170.html> - isopropylbenzene

<http://www.cdc.gov/niosh/ipcsneng/neng0059.html> - for 2-butoxyethanol

As a result, the discharge of the wax pattern etchant violates the specific national prohibition in 40 CFR 403.5(b)(7) against the introduction of pollutants which result in the presence of “toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems”. Furthermore, the discharge of the wax pattern etchant also results in a violation of the NDEP permit condition for the South Dayton wastewater treatment plant prohibiting the release of “objectionable odors from the collection systems, treatment facilities, effluent disposal facilities, sludge storage basins or at the reuse winter storage ponds”.

4.3 The National Prohibition Against Solid or Viscous Pollutants That Cause Obstructions Resulting in POTW Interference

Oakley introduces wax into the sewers from the wax removal autoclaves, the disposal of wax pattern etchant, and possibly from the disposal of zamboni floor cleaning waters. Oakley also could introduce petroleum and water-based cutting oils from its machining operations into the sewers from the disposal of zamboni floor cleaning waters. There is no evidence that these discharges have resulted in obstructions in the sewer lines, although the possibility remains, especially as melted or dissolved wax re-congeals in the sewers in contact with other solids or oils. The specific national prohibitions in 40 CFR 403.5(b)(3) prohibit the introduction of "*solid or viscous pollutants in amounts which will cause obstruction*" in the sewers resulting in sewer overflows or wastewater treatment plant interference.

4.4 The National Prohibition for Closed-Cup Flashpoint and Against Flammability

The risk of flammability or explosion in the sewers exists as long as the wax pattern etchant is discharged to the sewers. The aromatic hydrocarbons, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and isopropylbenzene are all listed as flammable. There are no measurement results at IWD-OK1 for closed-cup flashpoint. The specific prohibitions in 40 CFR 403.5(b)(1) prohibit the introduction of "*pollutants which create a fire or explosion hazard*".

4.5 The National Prohibitions for Minimum pH and Against Safety Hazards and Corrosive Structural Damage

Sewer collection system interferences related to the formation of hydrogen sulfide include worker safety hazards and unpermitted sewage releases caused by acidic disintegration of the sewers. Wastewater strength, sulfides, pH, temperature, and residence time all influence the formation and release of hydrogen sulfide within the sewers. The potential to cause acidic conditions in the sewers is unknown since there are no sample results at IWD-OK1 for pH, sulfides, or BOD. The local limits are expected to only establish numeric limits for pH. The specific national prohibitions in 40 CFR 403.5(b)(2) not only establish a minimum pH limit of 5.0 s.u., but also do not allow "*pollutants which will cause corrosive structural damage*" to the treatment works operations.

4.6 Local Limits for Oxygen Demanding Pollutants

There are no sample results at IWD-OK1 for BOD, ammonia, or nitrates. However, it is unlikely that the wastewaters discharged from Oakley to the sewers are strong enough in organics or nitrogen to pose a risk of adversely effecting the operation of the wastewater treatment plant. Nevertheless, technically-based local limits are expected to be developed for the South Dayton Valley wastewater treatment plant to do what the specific national prohibitions in 40 CFR 403.5(b)(4) require POTWs with NPDES permits to do, prohibiting "*oxygen demanding pollutants released in a discharge at a flow rate and/or pollutant concentration*" which will cause POTW interference.

4.7 Local Limits for Suspended Solids and Other Pollutants and That Could Pass-Through to the Receiving Waters

Total Suspended Solids – The risk of pass-through to the ground water from the Oakley discharges is unknown because there are no sample results at IWD-OK1 for total suspended solids. However, Oakley does discharge cloudy white ceramic washdown and vibratory deburring washdown both of which are expected to contain high levels of suspended solids. According to Lyon County, the ponds at the South Dayton wastewater treatment plant have periodically turned cloudy white themselves. Moreover, the pond effluent from the South Dayton wastewater treatment plant has exceeded its NDEP permit limit of 90 mg/l suspended solids. As a result, EPA concludes that the disposal of ceramic washdown could pose a risk of causing the pass-through of suspended solids to the ground waters. Technically-based local limits for total suspended solids would be expected. See Photos #1 and #3 on pages 3 and 4 of this report for pictures of the cloudy washwaters.

Toxics – The risk of pass-through to the ground water or into the sludge is unknown because there are no sample results at IWD-OK1 for antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, silver, zinc, or total toxic organics. Technically-based local limits would be expected for these pollutants because the Federal; sludge standards and the NDEP permit contain limits for toxic metals, and because the specific national prohibitions prohibit toxic fumes in the sewers. See item 4.2 of this report.

Salts – The pass-through risk for salts is unknown because there are no sample results at IWD-OK1 for either chlorides, total dissolved solids, or specific conductivity as an indicator measurement for salts. Technically-based local limits for chlorides, total dissolved solids, or specific conductivity would be expected because the NDEP permit limits chlorides in the ground water monitoring wells.

Nutrients – The risk of pass-through of nitrates to the underlying ground water is unknown because there are no samples results at IWD-OK1 for ammonia or nitrates. Sampling indicates that the South Dayton wastewater treatment plant does not provide full nitrification of ammonia to nitrates nor full denitrification of nitrates to nitrogen gas released to the atmosphere. The treatment plant effluent ammonia plus nitrate levels have exceeded 10.0 mg/l. The NDEP permit sets a 10.0 mg/l nitrate limit for the ground water and some monitoring wells #2 and #3 averaged 14.6 and 14.2 mg/l nitrate in 2004. As a result, since ammonia eventually oxidizes into nitrates in the environment, ammonia and nitrate levels from Oakley, if they are above domestic, could be considered to contribute to the pass-through of nitrates. There is one potential source of ammonia or nitrates from Oakley. The first ceramic shell coating uses ammonia to suspend the slurry. According to Oakley, after ten days, spent slurries are transferred from the slurry kettles to drums for drying. It is not clear whether the slurry kettles are then washed out between batches producing a washwater for disposal or simply cleaned through mechanical abrasion.

Section 5

Compliance with Federal Monitoring Requirements

Significant industrial users must self-monitor for all regulated parameters at least twice per year unless the sewerage agency monitors in place of self-monitoring. 40 CFR 403.12(e) & 403.12(g).

Each sample must be representative of the sampling day's operations. Sampling must be representative of the conditions occurring during the reporting period. 40 CFR 403.12(g) & 403.12(h).

5.0 Summary

The combined building discharge at IWD-OK1 has not been self-monitored by Oakley nor sampled by Lyon County for any of the pollutants of concern. The building discharges are not consistent over time nor on predictable schedules but rather strongly vary in strength and quantity depending on the operations. See parts 2.4 and 2.5 of this report for specific self-monitoring protocols. See Appendix 2 for the self-monitoring schedule projected to be in effect upon issuance of a permit or a self-monitoring order

Requirements

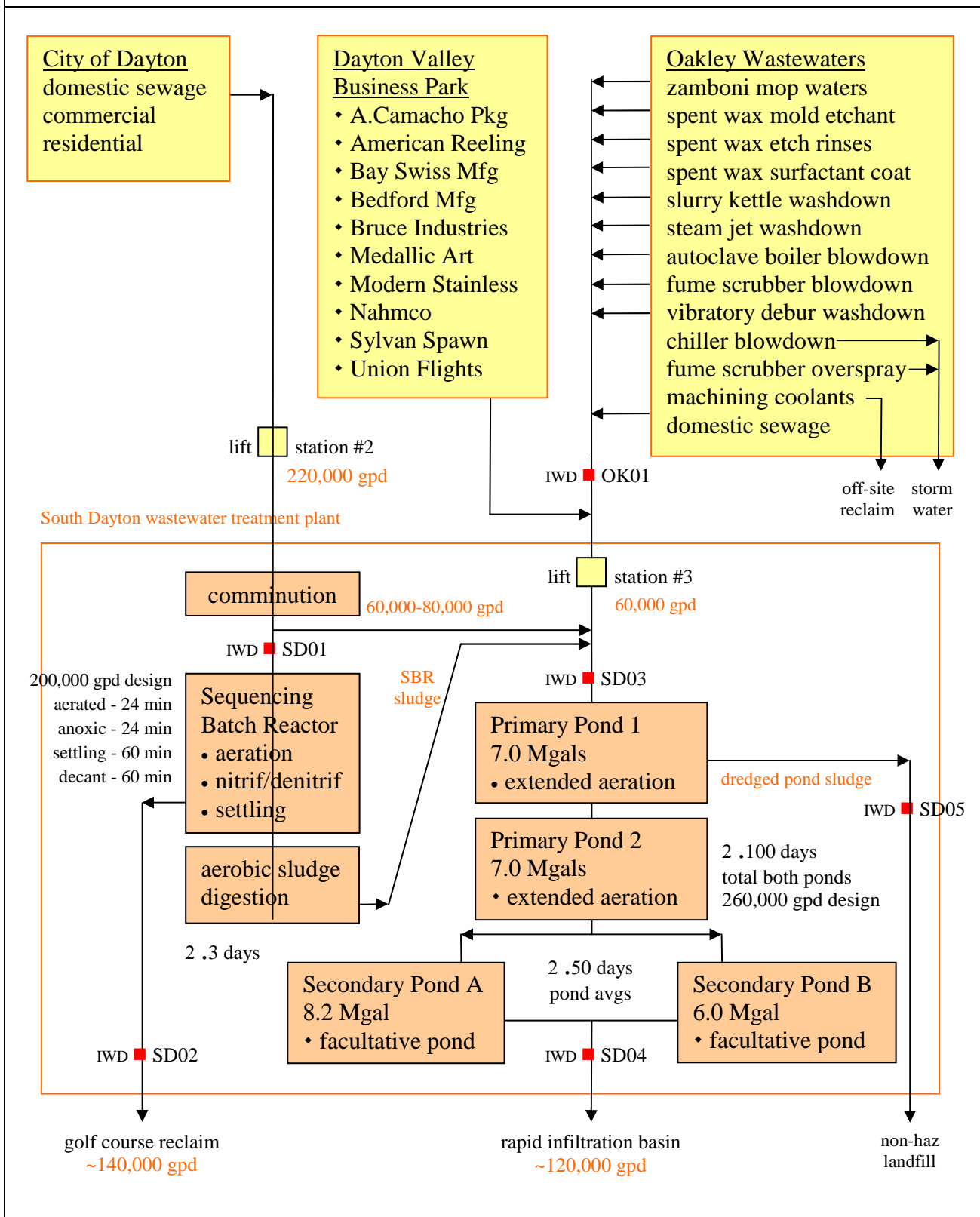
- The process-related wastewaters during normal operations must be self-monitoring at least twice per year for all of the pollutants of concern.
- Self-monitoring for total toxic organics and closed-cup flashpoint must also capture twice per year the discharge of spent wax pattern etchant, and spent wax pattern etching rinses.
- Self-monitoring for total suspended solids, ammonia, and nitrates must also capture twice per year the discharge of ceramic slurry washdown, and vibratory deburring tail waters.
- Self-monitoring for oil & grease must capture twice per year the discharge of zamboni mop waters, wax removal jet-wash from the autoclaves, spent wax mold etchant, and spent wax mold etching rinses.
- Self-monitoring for all of the pollutants of concern must be discrete grabs.

Recommendations

- Self-monitoring for the indicator measurements of pH, specific conductivity, and flow should be continuous.

Appendix 1

Oakley Manufacturing and the South Dayton Wastewater Treatment Plant Schematic of the Wastewater Collection and Treatment



Appendix 2

Sewer Discharge Standards and Limits Oakley @ IWD-OK1

pollutants of concern (mg/l)	expected upon revision of the Lyon County ordinance			
	Federal standards (daily-max)	national prohibitions (inst-max)	projected local limits (daily-max)	projected monitoring frequency
flow (gpd)	-	-	-	continuous
pH (s.u.)	-	<5.0	5.5 to 10.0	continuous
EC (µmohs/cm)	-	-	③	continuous
closed-cup flashpoint	-	<140°F	-	1/month
TSS	-	②	1000	1/month
oil&grease - petroleum	-	-	150	1/month
ammonia-N	-	-	③	1/month
nitrate-N	-	-	③	1/month
BOD	-	-	1000	2/year
sulfides	-	-	0.1	2/year
chlorides	-	-	③	2/year
total toxic organics	-	①	③	1/month
antimony	-	-	③	2/year
arsenic	-	-	③	2/year
barium	-	-	③	2/year
cadmium	-	-	③	2/year
chromium-total	-	-	③	2/year
copper	-	-	③	2/year
lead	-	-	③	2/year
mercury	-	-	③	2/year
molybdenum	-	-	③	2/year
nickel	-	-	③	2/year
selenium	-	-	③	2/year
silver	-	-	③	2/year
zinc	-	-	③	2/year

① Narrative prohibition against adverse impacts upon POTW.

② Bypass provision in 40 CFR 403.17(d) prohibits bypassing of treatment necessary to comply.

③ Technically-based local limits to be re-developed to ensure POTW permit compliance.

Appendix 3

Projected Pollutants of Concern for Oakley Oakley @ IWD-OK1

Federal standards and national prohibitions	POTW interference potential	POTW pass-through potential into the receiving waters the WWTP sludge	
<ul style="list-style-type: none"> ① total toxic organics for risks from toxic fumes ① pH minimum ② closed-cup flashpoint for explosivity ① oil & grease for sewer obstruction 	<ul style="list-style-type: none"> ③ BOD ① pH min/max ② sulfides ① oil & grease ② ammonia 	<ul style="list-style-type: none"> ② chloride ② specific conductivity ② nitrates ① total suspended solids ① oil & grease ③ antimony ③ arsenic ③ barium ③ cadmium ③ chromium ③ copper ③ lead ③ mercury ③ nickel ③ selenium ③ silver ③ zinc 	<ul style="list-style-type: none"> ③ arsenic ③ cadmium ③ copper ③ lead ③ mercury ③ molybdenum ③ nickel ③ selenium ③ zinc
<ul style="list-style-type: none"> ① sampling or inspection indicates the presences at levels above domestic ② no samples but could contribute to interference or pass-through potential by the POTW ③ unknown interference or pass-through potential 			

Appendix 4

Oakley Wastewater Discharge Quality @ IWD-OK1

After the July 10, 2001 Issuance of the Current NDEP Permit for the South Dayton WWTP

pollutants (mg/l)	effluent sampling results			current limits	viol rate	projected limits	viol rate	sample count
	mean	99th%	max					
<p>No sample results from Oakley for flow and the expected pollutants of concern:</p> <p>total toxic organics, closed-cup flashpoint, pH, specific conductivity, oil & grease, ammonia, nitrates, total suspended solids, BOD, sulfides, chlorides, antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, silver, and zinc.</p>								
Lyon County sample results pertaining to discharges of wastewater from Oakley ①								
sample date / type	sampling location ②			pertinent sampling results				
12/09/04 - grab	IWD-LS#3			1,2,4-trimethylbenzene – 1090 µg/l 1,3,5-trimethylbenzene – 488 µg/l isopropylbenzene – 238 µg/l				
05/23/05 - grab	IWD-MN#3			1,2,4-trimethylbenzene – 960 µg/l 1,3,5-trimethylbenzene – 388 µg/l isopropylbenzene – 242 µg/l				
06/01/05 - grab	IWD-MN#3			1,2,4-trimethylbenzene – 134 µg/l 1,3,5-trimethylbenzene – 56.8 µg/l isopropylbenzene – 26.2 µg/l				
06/01/05 - grab	IWD-MN#2			1,2,4-trimethylbenzene – 2660 µg/l 1,3,5-trimethylbenzene – 1450 µg/l isopropylbenzene – 256 µg/l				
① Samples collected upstream of Oakley on Lakes Blvd and on Airpark Blvd near non-detection. ② IWD-LS#3 – Lift station #3 influent into aeration ponds of the South Dayton Valley WWTP IWD-MH#3 – Manhole downstream of Oakley and above Airpark Blvd IWD-MH#2 – Manhole downstream of immediately downstream of Oakley								

Appendix 5

NDEP Permit and Federal Sludge Limits - South Dayton Valley WWTP

After July 10, 2001 Issuance of the Current NDEP Permit to the South Dayton Valley WWTP

Pollutants (mg/l)	IWD-SD02 SBR effluent to golf course			IWD-SD04 pond effluent to RIB			IWD-SD05 clean sludge
	d-max	mo-avg	inst-max	d-max	mo-avg	inst-max	mg/kg-dry
flow (mgd)	200000	-	-	260000	-	-	-
BOD	45	30	-	45	30	-	-
TSS	45	30	-	90	-	-	-
nitrate-N	-	10	-	-	-	-	-
ammonia-N	-	-	-	-	-	-	-
total nitrogen	-	-	-	-	-	-	-
antimony	-	-	-	0.006	-	-	-
arsenic	-	-	-	0.05	-	-	41
barium	-	-	-	1.0	-	-	-
beryllium	-	-	-	0.004	-	-	-
cadmium	-	-	-	0.10	-	-	39
chromium	-	-	-	0.05	-	-	-
copper	-	-	-	1.3	-	-	1500
lead	-	-	-	0.05	-	-	300
mercury	-	-	-	0.002	-	-	17
molybdenum	-	-	-	-	-	-	75
nickel	-	-	-	0.10	-	-	420
selenium	-	-	-	0.01	-	-	100
silver	-	-	-	0.05	-	-	-
zinc	-	-	-	5.0	-	-	2800
pH-minimum (s.u.)	-	-	<6.0 su.	-	-	<6.0 su.	-
pH-maximum (s.u.)	-	-	>9.0 su.	-	-	>9.0 su.	-
Narrative prohibitions							
objectionable odors	I.A.6 - none from collection system, treatment facilities, disposal, sludges						
floating solids / foam	I.A.5 - no discharge in other than trace amounts						
bypassing	II.A.4 - none unless beyond reasonable control and reported						

Appendix 6

South Dayton Valley WWTP Wastewater Quality – System I Reclaim

Jan 2003 Through December 2004

pollutants (mg/l)	IWD-SD01 influent			IWD-SD02 eff		violation rate		sample
	mean	5th%	99th%	mean	99th%	d-max	mo-avg	count
flow (mgd)	-	-	-	135625	218864	0/8	-	8
BOD	241.3	168.5	344.0	16.4	26.5	0/8	0/8	8
TSS	189.5	160.3	230.8	11.6	18.0	0/8	0/8	8
nitrate-N	-	-	-	1.28	2.28	-	0/8	8
ammonia-N	-	-	-	3.08	11.6	-	-	8
total nitrogen	-	-	-	5.67	12.4	-	-	8
statistical measures	no permit limits			median	min/max	inst-max		count
pH-minimum (s.u.)	no sample results			7.61	7.48	0/8		8
pH-maximum (s.u.)					7.73	0/8		

South Dayton Valley WWTP Wastewater Quality – System II Ground Water

Jan 2003 Through December 2004

pollutants (mg/l)	IWD-SD03 influent			IWD-SD04 eff		violation rate ① sample		
	mean	5th%	99th%	mean	99th%	d-max	mo-avg	count
flow (mgd)	-	-	-	116625	177140	0/8	-	8
BOD	199.3	100.0	339.4	26.9	43.4	0/8	2/8	8
TSS	239.5	86.0	678.4	66.9	109.1	1/8	-	8
nitrate-N	-	-	-	<1.0	<1.0	-	-	8
ammonia-N	-	-	-	4.57	15.1	-	-	7
total nitrogen	-	-	-	13.4	23.7	-	-	8
antimony	-	-	-	0.0095	0.0483	1/8	-	8
arsenic	-	-	-	<0.030	<0.030	0/8	-	8
barium	-	-	-	0.0334	0.0720	0/8	-	8
beryllium	-	-	-	<0.001	<0.001	0/8	-	8
cadmium	-	-	-	0.0018	0.0067	0/8	-	8
chromium	-	-	-	0.0068	0.0448	0/8	-	8
copper	-	-	-	0.0443	0.0795	0/8	-	8
lead	-	-	-	<0.010	<0.010	0/8	-	8
mercury	-	-	-	0.0001	0.0009	0/8	-	8
nickel	-	-	-	<0.010	<0.010	0/8	-	8
selenium	-	-	-	0.0059	0.0262	2/8	-	8
silver	-	-	-	<0.005	<0.005	0/8	-	8
zinc	-	-	-	0.0250	0.0511	0/8	-	8
statistical measures	no permit limits			median	min/max	inst-max		count
pH-minimum (s.u.)	no sample results			8.45	7.61	0/8		8
pH-maximum (s.u.)					9.09	1/8		

① Monthly averages calculated from all samples collected during a calendar month, even if one.